

इंटरनेट

मानक

Disclosure to Promote the Right To Information

Whereas the Parliament of India has set out to provide a practical regime of right to information for citizens to secure access to information under the control of public authorities, in order to promote transparency and accountability in the working of every public authority, and whereas the attached publication of the Bureau of Indian Standards is of particular interest to the public, particularly disadvantaged communities and those engaged in the pursuit of education and knowledge, the attached public safety standard is made available to promote the timely dissemination of this information in an accurate manner to the public.

“जानने का अधिकार, जीने का अधिकार”

Mazdoor Kisan Shakti Sangathan

“The Right to Information, The Right to Live”

“पुराने को छोड़ नये के तरफ”

Jawaharlal Nehru

“Step Out From the Old to the New”

IS 4911 (1986): Glossary of terms relating to bituminous waterproofing and damp-proofing of buildings [CED 41: Waterproofing and Damp-Proofing]



“ज्ञान से एक नये भारत का निर्माण”

Satyanarayan Gangaram Pitroda

“Invent a New India Using Knowledge”



“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”

Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”

BLANK PAGE



IS : 4911 - 1986

Indian Standard

GLOSSARY OF
TERMS RELATING TO BITUMINOUS
WATERPROOFING AND DAMP-PROOFING
OF BUILDINGS

(*First Revision*)

UDC 001.4 : 699.82

© Copyright 1987

BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

Indian Standard

GLOSSARY OF TERMS RELATING TO BITUMINOUS WATERPROOFING AND DAMP-PROOFING OF BUILDINGS

(*First Revision*)

Waterproofing and Damp-Proofing Sectional Committee, BDC 41

Chairman

PROF M. S. SHETTY

Representing

Ministry of Defence (Engineer-in-Chief's Branch)

Members

LT-COL V. K. KANITKAR (*Alternate to*

Prof M. S. Shetty)

SHRI R. C. ARORA
DR MOHAMMED ASLAM

Hindustan Petroleum Corporation Ltd, Bombay
Central Building Research Institute (CSIR),
Roorkee

SHRI S. S. CHANDOK

Central Public Works Department, New Delhi

SURVEYOR OF WORKS (NZ) (*Alternate*)

SHRI T. CHOUDHURY
SHRI S. S. DAS GUPTA

National Test House, Calcutta
Indian Oil Corporation Ltd, Bombay
Roofrite Private Limited, New Delhi

SHRI D. S. GHUMMAN

SHRI K. K. LAL (*Alternate*)

SHRI A. D. GUPTA

Fertilizer (Planning and Development) India Ltd,
Dhanbad

SHRI M. S. GUPTA

Roof Waterproofing Company, Calcutta

SHRI S. N. DUTTA GUPTA

Bharat Petroleum Corporation Ltd, Bombay

SHRI A. D. NAYAK (*Alternate*)

SHRI S. K. JAIN

Hoechst Dyes & Chemicals Ltd, Bombay

SHRI K. A. T. VARGHESE (*Alternate*)

SHRI M. B. JAYWANT

Synthetic Asphalts, Bombay

SHRI S. K. KARAMCHANDANI

Union Carbide India Ltd, Calcutta

SHRI V. NIJHAYAN (*Alternate*)

SHRI M. R. MALYA

In personal capacity (Flat No. 3, Panorama, 30 Pali
Hill Road, Bombay 400005)

SHRI S. P. MODI

Engineers India Limited, New Delhi

SHRI A. G. POL

Public Works Department, Government of
Maharashtra, Bombay

SHRI R. P. PUNJ

Lloyd Bitumen Products, Calcutta

SHRI M. M. MATHAI (*Alternate*)

(*Continued on page 2*)

© Copyright 1987

BUREAU OF INDIAN STANDARDS

This publication is protected under the *Indian Copyright Act* (XIV of 1957) and reproduction in whole or in part by any means except with written permission of the publisher shall be deemed to be an infringement of copyright under the said Act.

(Continued from page 1)

Members

Representing

SHRI T. K. ROY	Shalimar Tar Products (1935) Ltd, Calcutta
SHRI B. K. BHATTACHARYA (<i>Alternate</i>)	
SHRI A. SEN GUPTA	Ministry of Railways, Calcutta
SENIOR DEPUTY CHIEF ENGINEER (BUILDING)	Public Works Department, Government of Tamil Nadu, Madras
SUPERINTENDING ENGINEER	
DESIGN CIRCLE (<i>Alternate</i>)	
SHRI A. SHARIF	FGP Limited, Bombay
SHRI G. K. TAKIAR (<i>Alternate</i>)	
CAPT ASHOK SHASTRY	Onsar Chemical Pvt Ltd, Bombay
SHRI S. K. BANERJEE (<i>Alternate</i>)	
SHRI Y. S. SRINIVASAN	National Buildings Organization, New Delhi
SHRI SHASHI KANT (<i>Alternate</i>)	
PROF C. G. SWAMINATHAN	Central Road Research Institute (CSIR), New Delhi
SHRI Y. G. GOKHALE (<i>Alternate</i>)	
SHRI G. RAMAN,	Director General, BIS (<i>Ex-officio Member</i>)
Director (Civ Engg)	

Secretary

SHRI M. SADASIVAM
Assistant Director (Civ Engg), BIS

Indian Standard

GLOSSARY OF TERMS RELATING TO BITUMINOUS WATERPROOFING AND DAMP-PROOFING OF BUILDINGS

(First Revision)

0. FOREWORD

0.1 This Indian Standard (First Revision) was adopted by the Indian Standards Institution on 4 July 1986, after the draft finalized by the Waterproofing and Damp-Proofing Sectional Committee had been approved by the Civil Engineering Division Council.

0.2 Bitumen has been extensively used for waterproofing and damp-proofing of buildings. Considerable development has been made in the efficient handling and application of bituminous materials for waterproofing and damp-proofing purposes. As there are number of technical terms in use in the field of bituminous waterproofing, it was felt that standardization of terminology would be useful to engineers, architects and contractors connected with waterproofing and damp-proofing works.

0.3 This standard was first published in 1968. The revision of this standard has been taken up to incorporate additional terms and to keep it in line with IS : 334-1982 'Glossary of terms relating to bitumen and tar'.

0.4 In the formulation of this standard due weightage has been given to international co-ordination among the standards and practices prevailing in different countries in addition to relating it to the practices in the field in this country. This has been met by basing the standard on the following publications:

BS 2717 : 1956 Glossary of terms applicable to roof coverings.
British Standards Institution.

ASTM Designation : D 1079-79 Standard definitions of terms relating to bituminous, roofing, waterproofing and bituminous materials. American Society for Testing and Materials.

1. SCOPE

1.1 This standard covers definitions of terms relating to bituminous waterproofing and damp-proofing materials used in building construction.

2. DEFINITIONS

A

Adhesion — The property by means of which a material in a liquid or semi-solid form adheres or sticks to the surface of a solid body.

Alligatoring — The cracking of the surfacing bitumen on a built-up roof, producing a pattern of cracks similar to an alligator's hide; the cracks may not extend through the surfacing bitumen.

Apron — Bitumen felt or bitumen mastic applied vertically to the fascia or overhang of a roof.

Ash — Inorganic residue remaining after ignition of combustible substances.

Asphalt — A natural or artificial mixture in which bitumen is associated with inert mineral matter. The word 'asphalt' should always be qualified by indication of its origin or nature.

Asphalt, Mastic — An intimate mixture of mineral fillers, well graded sand and/or stone chippings with a hard grade of bitumen, cooked and laid hot manually by means of a wooden float. The mixture settles to a coherent voidless and impermeable solid or semi-solid mass under normal temperature conditions.

B

Bay — This part of an area to which waterproofing is applied in one continuous operation. The term is not applied to part of a roof area laid in a narrow width.

Bitumen — A black or dark brown non-crystalline solid or viscous material having adhesive properties, derived from petroleum either by natural or refinery processes and substantially soluble in carbon-disulphide or carbon tetrachloride or trichloroethylene.

Bitumen Blown or Oxidized — Bitumen, the properties of which are modified by blowing air through it, at a comparatively high temperature.

Bitumen Cutback — Bitumen, the viscosity of which is reduced with a volatile diluent, usually a petroleum distillate.

- a) *Cutback, Rapid Curing* — Bitumen, which has been blended with a naphtha type of distillate.
- b) *Cutback, Medium Curing* — Bitumen which has been blended with a kerosene type of distillate.

- c) *Cutback, Slow Curing* — Bitumen, which is blended with or containing a higher viscous oil than in medium or rapid curing cutback.

Bitumen Emulsion — A liquid product in which a substantial amount of bitumen is dispersed in a finely divided condition in an aqueous medium containing an emulsifier and a stabilizer.

Bitumen Felts — A sheet or fabric which is saturated with a suitable bitumen or bituminous material. There are the following types:

- a) *Bitumen Felt (Fibre Felt)* — In this class the fibre felt base is saturated with a suitable bitumen. There are the following types:
- 1) *Coated and sanded bitumen felt* — In which the base is coated with oxidized bitumen and surfaced on each side with a dressing of fine sand.
 - 2) *Mineral-surfaced bitumen felt* — In which the base is coated with oxidized bitumen. The upper surface is finished with talc or fine sand.
 - 3) *Reinforced bitumen felt* — In which the base is coated with oxidized bitumen on both sides and a layer of suitable organic or inorganic mat is embedded in the felt to strengthen it.
 - 4) *Sanded bitumen felt* — In which the base is surfaced in each side with a dressing of fine sand.
 - 5) *Saturated bitumen felt* — This felt has no bituminous coating and no surface dressing is necessary.
 - 6) *Self-finished bitumen felt* — In which the base is coated with oxidized bitumen and surfaced on each side with a dressing of finely divided talc.
- b) *Fluxed Pitch Felts* — In this class the fibre felt base is saturated with a suitable fluxed coal tar pitch. These are of the following types:
- 1) *Sanded fluxed pitch felt* — In which the base is coated with fluxed coal tar pitch and surfaced on each side with a dressing of sand.
 - 2) *Saturated fluxed pitch felt* — This felt has no coating and no surface dressing is necessary.

- c) *Impregnated Flax Felts and Hair Felts* — In this class the waterproofing material is either fluxed coal tar pitch, brown wood tars, wood pitches of similar materials. The following, types are in this class:
- 1) *Impregnated flax felt (black and brown)* — In which the base consists of jute flax or similar long staple vegetable fibres loosely felted together.
 - 2) *Impregnated hair felt (black and brown)* — In which the base consists of a mixture of suitable animal hair. There may also be a proportion of jute or other vegetable fibres in brown impregnated hair felt.
- d) *Bitumen felt (Asbestos base)* — In this class the base consists of a sheet of asbestos fibre containing not less than 80 percent of asbestos and is saturated with a suitable bitumen.
- 1) *Saturated bitumen asbestos felt* — This felt has no bitumen coating and no surface dressing is necessary.
 - 2) *Self-finished bitumen asbestos felt* — In which the base is coated with oxidized bitumen and surfaced on each side with a dressing of finely divided talc.

Bitumen, Industrial — Also known as blown or oxidized bitumen, needed for a variety of industrial applications.

Bitumen, Mastic — An intimate mixture of mineral fillers, well graded sand and/or stone chippings with a hard grade of bitumen, cooked and laid hot manually by means of a wooden float. The mixture settles to a coherent, voidless and impermeable solid or semi-solid mass under normal temperature condition.

Bitumen Primer — A low viscous binder made from bitumen, usually by mixing it with light diesel oil or furnace oil, and is applied cold over non-bituminous surface for arresting dust, filling capillary voids and for serving as a bond with the superimposed layer.

Bitumen, Straight Run — Bitumen obtained as the end product or residue from refining of crude petroleum.

Bitumen, Steam Refined — Residue distillation of crude petroleum process further with the help of steam to a specified viscosity or penetration.

Bituminous — Containing or treated with, bitumen, tar or other similar materials.

Bituminous Grout — A bituminous material or a mixture of bituminous material and fine mineral aggregate, when poured hot will flow into place without mechanical manipulation.

Blinding Screed — Cement Mortar laid on top of hard core in order to smooth off its surface for laying membrane damp-proofing materials thereon to prevent the membrane from getting punctured by projections.

Blocks — Bitumen mastic cast in various shapes to form sold cakes, in sizes convenient for handling.

Bonding Compound — Bitumen melted and applied hot, or other suitable bituminous compound for fixing the first layer of the felt to the base and subsequent layers or felt, together.

Built-up Roofing — A continuous, semi-flexible, membrane consisting of plies of saturated felts, coated felt fabrics or mats assembled in place with alternate layers of bitumen, and surfaced with mineral aggregate bitumen materials.

C

Capillary Break — A space left between two surfaces to prevent capillary action.

Capillary Rise of Moisture — The rise of moisture through the capillaries of an intervening porous material without the aid of hydrostatic pressure.

Cap Sheet — The top layer of mineral surfaced bitumen felt when employed in built-up roofing.

Cauldron — A cylindrical steel vessel fitted with a fire-box and used at the site of works for the purpose of remelting bitumen mastic prior to laying, generally applied to a plant which is not mechanically agitated.

Check Fillet (Water-Check) — A kerb formed of concrete or timber covered by bitumen felt or bitumen mastic on a roof surface to control rain water.

Cloutnails — Nails with large flat heads for fixing felts.

Coal Tar — A dark brown to black cementitious material produced by the destructive distillation of coal.

Coal Tar Felt — A felt saturated with refined coal tar.

Coal Tar Pitch — The black or dark brown, solid or semi-solid, fusible, and agglomerative residue remaining after partial evaporation or fractional distillation of coal tar.

Coat — A single layer of bitumen or bitumen mastic of indefinite area but applied to a specified thickness.

Coating Compound — A mixture of bitumen and mineral filler used for coating the saturated fibre felt.

Collar — A formation of bitumen felt or bitumen mastic around a pipe or other projection through a roof, ensuring a watertight joint.

D

Damp-Proofing — Treatment of a surface or structure to resist the passage of water in the absence of hydrostatic pressure.

Dressing Compound — Any bituminous material used hot or cold for top dressing the exposed surface of the bitumen felt.

Drip — A strip of roofing felt or metal fixed under or between the layers of the roof covering at eaves or verges and turned down, or the undercut edge of an apron.

Ductility — The property by which a material can be drawn out without breaking, for it is measured by the distance in millimetres to which it will elongate before breaking, when two ends of a briquette specimen of the material of the specified from the cross-section are pulled apart under water at a specified speed and temperature.

E

Eaves — The lower or draining edge of a roof.

F

Fall — The slope of a flat room or a gutter.

Fibrous Glass Mat — A thin flexible uniformly bonded mat, composed of chemically resistant borosilicate staple glass fibres, distributed in a random open porous structure, bonded with a thermosetting resin.

Fillet — A triangular strip of mortar or concrete or masonry applied at abutments, top edges, under verges and in similar positions to make the angle waterproof.

Fine Mineral Surfacing — Water insoluble inorganic mineral material more than 50 percent of which passes 500-micron IS Sieve which are used on the surface of roofing.

Flashing — A strip of impervious material, usually metal, used to exclude water from the junction between a roof covering and another part of the structure:

- a) *Apron Flashing* — A flashing the lower edge of which is lapped over the roof covering.
- b) *Cover Flashing* — A flashing used in conjunction with other components, such as soakers, the vertical parts of which it overlaps.
- c) *Eaves Flashing* — A metal strip with a welted edge or a reinforced felt strip dressed into an eaves gutter.

- d) *Raking Flashing* — A flashing used to cover an inclined inter-section when the top edge is secured into a chase cut parallel to the top surface of the roof covering.
- e) *Stepped Flashing* — A flashing used to cover an inclined inter-section its upper edge being shaped to step up from course to course of brickwork or masonry and secured into the horizontal joints.

Flash Point — The lowest temperature at which the vapour of the material can be ignited momentarily in air by a flame under specified conditions of test.

Flat Roof — A practically level roof surface with only a small slope for purpose of drainage; the term is used in contrast with 'pitched or sloped roof'.

Float — A flat faced tool, with a handle, used for spreading and finishing the surface of bitumen mastic.

Flush Finish — The trimming of roofing felt to eaves or verges where a drip is not required.

Flux — A bituminous material used as good stock for further processing and as a material to soften other bituminous material.

G

Gauges — Wooden or metal strips temporarily fixed to assist in the spreading or laying the bitumen mastic to the required contour and thickness.

H

Hardness Number — The hardness number is the figure denoting the depth, in tenths of a millimetre, to which a flat-ended indentor pin in the form of a steel rod 6.35 mm diameter will penetrate the mastic under a load of 31.7 kg applied for one minute, the temperature being maintained at $35 \pm 0.5^{\circ}\text{C}$ or $45 \pm 0.5^{\circ}\text{C}$ as specified.

Hip — The meeting line of two inclined roof surfaces which meet at a salient angle.

Hip Capping — An additional strip of bitumen felt fixed as a protective finish to the hip.

I

Isolating Membrane — Bitumen felt or other suitable material used to isolate bitumen mastic covering from the roof structure.

L

Lap — The extent by which the abutting edges of bitumen felts overlap each other.

Lapped Joint — A joint formed by over-lapping adjoining bitumen felts.

Layer — A single thickness of bitumen felt or bitumen.

M

Mechanical Mixer — A machine, fitted with a fire-box and a power unit to provide mechanical agitation, used for the purpose of remelting bitumen mastic. The machine is generally built in the form of a trailer vehicle.

Membrane — Any functionally continuous flexible structure of felt or fabric and bituminous cementing material used for roofing or waterproofing.

Mineral Granules — Granular inorganic mineral material (medium or coarse sand, gravel, chippings, etc) more than 50 percent of which is retained on the 500-micron IS Sieve.

Mineral Stabilizer — Water insoluble inorganic fine mineral material all of which will pass 150-micron IS Sieve used in admixture with solid or semi-solid bituminous materials.

Mineral Surfaced Roofing — Felt or fabric saturated with bitumen, coated on one or both sides with a bituminous coating and surfaced on its weather side with mineral granules.

Mopping — The method of application of hot bitumen compound by means of mops and brushes. There are four ways of mopping.

- a) *Solid* — A continuous coating;
- b) *Spot* — Bitumen is applied in roughly circular areas, generally about 460 mm in diameter, leaving a grid of unmopped, perpendicular areas;
- c) *Strip* — Bitumen is applied in parallel bands, generally 200 mm wide and 300 mm apart; and
- d) *Sprinkle* — Bitumen is shaken onto the substrate from a broom or mop in a random pattern.

Mopping Coat — A heavy application of bituminous material applied hot with mop or mechanical application to structural surfaces or saturated felts in waterproofing and membrane roof construction.

P

Penetration — A measure of hardness or consistency of the bitumen. It is the vertical distance traversed by a standard needle entering the material under specified conditions of standard load, time and temperature; and is expressed in tenths of millimetre.

Pitch — The angle of inclination with the horizontal of the rafters or base surface on which the roof coverings are laid.

Pitch Roof — A roof the pitch of which is greater than 10° to the horizontal.

Ply — A layer of felt in a built-up roofing membrane; a four-ply membrane has at least four plies of felt at any vertical cross section cut through membrane.

Pouring and Rolling — The method of application of hot bitumen compound by pouring in advance of the roll of roofing felt when laying.

R

Reinforcement — Bitumen coated plain expanded metal lathing used for laying bitumen mastic to vertical or sloping surfaces.

Retaining Kerb — A kerb, usually of metal, fixed at eaves or verges of roofs to act as a stop for the surfacing.

Ridge — The meeting line of two inclined surfaces at the apex of a roof.

Ridge Capping — An additional strip of bitumen felt fixed as protective covering at a ridge.

Roof Finish — The top part of a flat roof which contributes protection and durability to it, without itself being a structural or supporting element in the roof.

Roofing Felt — A sheet of felted or woven fibres rendered partially or completely impervious to water by treatment with bituminous materials.

Rubbing — The process by which the top coat of bitumen mastic is given a malt surface finish by the use of fine sand.

S

Saturant — Bitumen or coal tar pitch used during the manufacture of roofing felt for saturating the base fabric before the coating process.

Saturated — A term describing a membrane which is filled as completely as practicable with bituminous material.

Sealing Compound — A liquid or semi-liquid bituminous material applied hot or cold, used for sealing the laps of felts.

Skirting (Upstand) — The portion of roof covering turned up against a vertical surface (but not necessarily tucked into a groove).

Smooth Surfaced Roofing — Felt or fabric saturated with bitumen, coated on both sides with a bituminous coating and surfaced with fine mineral surfacing.

Softening Point — The temperature at which a standard ball passes through a sample of bitumen in a mould and falls through a height of 25 mm, when heated under water or glycerene at specified conditions of test.

Surfacing — A protective covering of gravel or tiles, etc, laid on top of the built-up roofing.

T

Tar — A viscous material having adhesive properties, obtained from the destructive distillation of certain types of organic material. The word 'tar' shall be preceded by the name of the material from which it is produced, that is, coal, shale, peat, etc. Its mode of production shall also be indicated.

Tuck-in — That portion of the roofing felt, skirting or cover flashing tucked into a chase.

Turn up — See 'Skirting (Upstand)'.

U

Underlay — A layer of bitumen-saturated felt or other material used below the first coat of bitumen mastic when the waterproofing treatment is to be isolated from the roof structure.

V

Vapour Barrier — Roofing felt or other impervious material, laid below roof insulation to prevent transmission of moisture into the insulation.

Viscosity — The property of a liquid by which it resists flow due to internal friction and is measured by the ratio of the shearing stress to the rate of shear.

W

Water Barrier — A kerb, raised above the roof surface and covered by the built-up roofing to control rain water.

Water Content — The proportion of water present in a material expressed as a percentage by weight of the material.

Water Drip — A finish at eaves or verges formed by a strip of roofing felt.

Waterproofing — The treatment of a surface or structure to prevent the passage of water under hydrostatic pressure.

BUREAU OF INDIAN STANDARDS

Headquarters:

Manak Bhavan, 9 Bahadur Shah Zafar Marg, NEW DELHI 110002

Telephones : 331 0131 331 1375

Telegrams : Manaksanstha
(Common to all Offices)

Regional Offices:

Telephone

*Western : Manakalaya, E9 MIDC, Marol Andheri (East) BOMBAY 400093 6 32 92 95

†Eastern : 1/14 C. I. T. Scheme VII M, V. I. P. Road, Maniktola, CALCUTTA 700054 36 24 99

Northern : SCO 445-446, Sector 35-C CHANDIGARH 160036 { 2 18 43
3 16 41

Southern : C. I. T. Campus, MADRAS 600113 { 41 24 42
41 25 19
41 29 16

Branch Offices:

Pushpak, Nurmohamed Shaikh Marg, Khanpur AHMADABAD 380001 { 2 63 49
2 63 49

F Block, Unity Bldg, Narasimharaja Square, BANGALORE 560002 22 48 05

Gangotri Complex, 5th Floor, Bhadbhada Road, T. T. Nagar, BHOPAL 462003 6 67 16

Plot No. 82/83, Lewis Road, BHUBANESHWAR 751002 5 36 27

53/5 Ward No. 29, R. G. Barua Road, 5th Byelane, GUWAHATI 781003 —

5-8-56C L.N. Gupta Marg, HYDERABAD 500001 22 10 83

R14 Yudhister Marg, C Scheme, JAIPUR 302005 { 6 34 71
6 98 32

117/418 B Sarvodaya Nagar, KANPUR 208005 { 21 68 76
21 82 92

Patliputra Industrial Estate, PATNA 800013 6 23 05

Hantex Bldg (2nd Floor), Rly Station Road, TRIVANDRUM 695001 52 27

Inspection Office (With Sale Point):

Institution of Engineers (India) Building, 1332 Shivaji Nagar, PUNE 411005 5 24 35

*Sales Office in Bombay is at Novelty Chambers, Grant Road, BOMBAY 400007 89 65 28

†Sales Office in Calcutta is at 5 Chowringhee Approach, P.O. Princep Street, CALCUTTA 700072 27 68 00